

DISCOVERING THE CONNECTION: YOUR ENVIRONMENT, YOUR HEALTH

AFTERSCHOOL SCIENCE CLUB CURRICULUM FOR MIDDLE SCHOOL STUDENTS



DEVELOPED BY K-12 SPECIALIZED INFORMATION SERVICES GROUP,
NATIONAL LIBRARY OF MEDICINE, NATIONAL INSTITUTES OF HEALTH



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ABOUT DISCOVERING THE CONNECTION: YOUR ENVIRONMENT, YOUR HEALTH

PURPOSE OF THE CURRICULUM

Discovering the Connection: Your Environment, Your Health uses the Tox Town Web site (toxtown.nlm.nih.gov) developed by the National Library of Medicine (NLM) to introduce middle school students to environmental health issues in everyday life. The curriculum includes information and laboratory research and communication activities, stressing the relevance of science to informed citizenship and integrating science, society, and literacy. The curriculum is for an afterschool club, but can also be used in the science classroom. The curriculum is based on National Science Education Standards.

Teaching and Learning Approaches

The curriculum uses inquiry-based learning and problem-based learning approaches. These are student-centered approaches that promote in-depth understanding and critical thinking by fostering students' active engagement with the subject matter. Students develop content knowledge and scientific reasoning skills through collaborative work on real world problems. They explore ideas, formulate meaningful questions, collect and analyze data, and evaluate and communicate their findings.

Tox Town Web Site

Tox Town (toxtown.nlm.nih.gov) is visually engaging and is an authoritative, reliable educational Web site, dedicated to highlighting the connections among chemicals, the environment, and the public's health.

Curriculum Development Team

This effort was initiated and coordinated by the NLM K-12 Specialized Information Services group. The NLM, one of the institutes of the National Institutes of Health (NIH), has been a center of information innovation since its founding in 1836. The K-12 group develops authoritative resources for a variety of science education areas, coordinates outreach to educators and school health professionals, and conducts research into teaching and learning.

The working group for this curriculum consists of: the NLM K-12 staff; Daniel M. Levin, a professor of science education from the University of Maryland College of Education; and five teachers from Montgomery County, MD, and the District of Columbia. The teachers are Jacquelyn Geer (science), Maura Hinkle (science), Sandra Garner (language arts), Kelley Knox (social studies), and Berneatta Barnes (science).

Curriculum Overview and Suggested Use

The curriculum contains six units. Each unit introduces one environmental health topic and includes three or four 50-60 minute lessons in the following format:

- Topic introduction and information research activity using Tox Town;
- Hands-on experiment or activity reinforcing understanding, conducted with simple materials; and
- Communication and social action activity where students share their understanding of the topic with others and translate their understanding into actions.

The units can be used sequentially or individually to support the existing middle school science curriculum. They can also be used to support the science/society connection in the social science or language arts classroom. The entire curriculum was pilot-tested as an afterschool club at the Cabin John Middle School, Montgomery County, MD.

The Six Units of the Curriculum

1. **Water Quality:** Introduces students to drinking water quality issues and the water treatment process. Includes experiments where students test school drinking water, compare it with water from other sources, and communicate the findings to the school community.
2. **Air Quality:** Introduces students to air quality issues and the impact of air pollution on human health. Students test air quality in several locations in and around the school.
3. **Chemicals in Your Home:** Informs students about potentially toxic chemicals in common products and introduces safer alternatives.
4. **Food Safety:** Introduces students to biological, chemical, and physical contaminants in food. Uses an experiment to teach safe food handling.
5. **Runoff, Impervious Surfaces, and Smart Development:** Introduces students to the relationship among runoff, water pollution, and human health. Also introduces the idea of responsible development.
6. **The Great Debate: Bottled Water vs. Tap Water in Our School:** Students perform research about pros and cons of different sources of drinking water, engage in a debate, and develop persuasive arguments to advocate for bottled or tap water as a primary source of drinking water in the school.

Symbols Used in This Curriculum

-  – information research via Tox Town
-  – lab experiment
-  – hands-on activity
-  – communication and social action activity
-  – excerpt from student handouts in teacher directions